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10/577,049	12/12/2006	Laurent Labrousse	289852US0PCT	2322
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER HAILEY, PATRICIA L	
			ART UNIT	PAPER NUMBER
			1793	
			NOTIFICATION DATE	DELIVERY MODE
			07/08/2010	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/577,049	<b>Applicant(s)</b> LABROUSSE ET AL.	
	<b>Examiner</b> PATRICIA L. HAILEY	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14-31 is/are pending in the application.
- 4a) Of the above claim(s) 16-19 and 27-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14, 15, 20-26, and 31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

Applicants' remarks and amendments, filed on April 6, 2010, have been carefully considered. Claim 13 has been canceled; new claim 31 has been added.

Claims 1-12 and 14-31 are now pending in this application.

Support for new claim 31 can be found in the Specification at page 5, lines 21-29.

### ***Election/Restrictions***

Claims 16-19 and 27-30 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected process for manufacturing a structure, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 19, 2009.

Applicants' intention to seek rejoinder of the non-elected claims, in the event of the indication of allowable subject matter, is duly noted.

Claims 1-12, 14, 15, 20-26, and 31 remain under consideration by the Examiner.

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Document was filed on April 24, 2006.

***Withdrawn Rejections***

The rejections of record stated in the previous Office Action have been withdrawn in view of Applicants' amendment to claim 1 (i.e., by the incorporation therein of the subject matter of claim 13).

***New Grounds of Rejection***

The following New Grounds of Rejection are being made in view of Applicants' amendment to claim 1, and in view of the Examiner's reconsideration of the references of record. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 103***

***2. Claims 1-4, 9-15, and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogino et al. (U. S. Patent No. 6,436,542) in view of Boire et al. (U. S. Patent No. 6,103,363).***

Ogino et al. teach a multilayer structure which functions as a photocatalyst, said structure comprising a substrate and formed thereon a film mainly comprising titanium oxide and having photocatalytic activity, which comprises sputtering a conductive sinter target obtained by sintering a mixture of particles of titanium oxide and particles of at least one metal oxide selected from, inter alia, niobium oxide, tantalum oxide, vanadium oxide, and zirconium oxide, in an atmosphere capable of

having a regulated vacuum to form the film mainly comprising titanium oxide and having photocatalytic activity on the substrate (claims 1 and 10). See col. 2, lines 22-35 of Ogino et al.

The film mainly comprising titanium oxide is obtained by sputtering in a surrounding gas such as an inert gas (e.g., argon), or a mixed gas comprising an inert gas and oxygen (claim 11). See col. 2, lines 36-47 of Ogino et al.

Exemplary substrates include glass (col. 4, lines 33-44); when a glass plate is used as a substrate, a primer film serving to prevent alkali components of the substrate from dissolving in the titanium oxide film is disposed between the substrate and the titanium oxide film (claims 14, 15, and 25). “From the standpoint of further improving anti-fouling properties, it is preferred to partly or wholly coat the titanium oxide film of the present invention with a hydrophilic film.” See col. 4, lines 46-55 of Ogino et al.

In Figure 1 of Ogino et al., a multilayer structure is depicted, wherein a glass substrate, a primer film comprising silicon dioxide, a titanium oxide film having photocatalytic activity, and a hydrophilic film are shown (claims 1, 14, 15, and 25). See also col. 5, lines 1-22.

Regarding claims 2-4 and 12, Ogino et al. teach “silicon films or films containing silicon dioxide as the main component” as examples of the hydrophilic film. See col. 6, lines 26-32 of Ogino et al.

The limitation “has been deposited by room temperature vacuum sputtering” recited in claim 12 is considered a product-by-process limitation; “[A]ny difference

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imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct, not the examiner to show that the same is a process of making." In re Brown, 173 U.S.P.Q. 685 and In re Fessmann, 180 U.S.P.Q. 324.

Regarding claim 9, Ogino et al. teach a hydrophilic SiO<sub>2</sub> film having a thickness of 10 nm. See Table 2 of Ogino et al.

Regarding claims 21-24, Ogino et al. teach, in the formation of the photocatalytically titanium oxide film, forming a molded product of, for example, titanium oxide and niobium oxide, and degreasing and burning the molded product (col. 5, lines 46-61; "heat treatment"), and employing magnetron sputtering (col. 6, lines 3-16).

Although Ogino et al. teach a primer film serving to prevent alkali dissolution underlying the titanium oxide film, this reference does not explicitly teach or suggest that the underlayer assists in the crystallization in the anatase form of the photocatalytic upper layer (claims 1 and 26).

Further, regarding claim 20, Ogino et al. teach that the structures are "applicable to various articles...", such as window glasses for buildings, mirrors, etc. (col. 1, lines 13-26 of Ogino et al.), but does not specifically disclose the term "glazing".

Boire et al. teach a structure similar to that of Ogino et al., having a substrate provided on at least one of its faces with a coating having a photocatalytic property containing at least partially crystalline titanium oxide, and also, between the substrate and the coating, one or a number of thin layers with a different or complimentary function to that of the coating. Layers with an anti-static, thermal, or optical function or promoting the crystalline growth of  $\text{TiO}_2$  in the anatase or rutile form (claims 1 and 26) or of layers forming a barrier to the migration of certain elements originating from the substrate, in particular forming a barrier to alkali metals and very particularly to sodium ions when the substrate is made of glass. See col. 5, lines 21-30 of Boire et al.

It would have been obvious to one skilled in the art to modify the teachings of Ogino et al. by incorporating therein an underlayer with an anti-static, thermal, or optical function or promoting the crystalline growth of  $\text{TiO}_2$  in the anatase or rutile form, motivated by the teachings of Boire et al.

With respect to claim 20, Boire et al. teach that it is known in the art to choose titanium oxide “to manufacture a glazing”, see col. 1, lines 6-37 and col. 1, line 56 to col. 2, line 4.

Motivated by the teachings of Boire et al., the skilled artisan would have found it obvious that the structure of Ogino et al. would suitably function as a glazing.

**3. Claims 1-11, 14, 15, 20, 21, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doushita et al. (U. S. Patent No. 6,576,344).**

Doushita et al. teach a photocatalyst article comprising a photocatalyst film formed on a substrate (col. 9, lines 13-16), and having an overcoat layer formed on top of the photocatalyst film, wherein the overcoat layer may be selected from among silicon oxide, aluminum oxide, titanium oxide, zirconium oxide, and cerium oxide (col. 10, lines 20-28; claims 1-5).

Regarding claim 9, Doushita et al. teach that the overcoat layer preferably has a thickness of 0.1 to 50 nm, see col. 14, lines 1-7.

Regarding claim 10, Doushita et al. teach that the photocatalyst film contains an oxide semiconductor (e.g., titanium oxide) and a compound which contains at least one type of element selected from, inter alia, V and Nb, see col. 5, lines 14-30.

Regarding claim 11, Doushita et al. teach that the photocatalyst film is made using methods such as sol-gel methods, see col. 5, lines 63-65 of Doushita et al.

Regarding claims 1, 14, 15, 25, and 26, Doushita et al. teach that an alkali-blocking film comprising silicon oxide and zirconium oxide with a zirconium oxide content of 1 weight % or more and 30 weight % or less, which is especially preferable, may be provided on the substrate (e.g., glass), and that, when a glass material containing an alkali metal is to be used as the substrate, an alkali-blocking film is provided on the glass substrate to prevent lowering of crystallinity of the titanium oxide film, see col. 4, lines 18-58 of Doushita et al.

Regarding claim 20, Doushita et al. teach that the photocatalyst article is suitable in anti-fogging, anti-soiling articles, which are suitable as window glass,



mirrors, lenses, sheets, showcases, etc., used for construction, vehicles, etc. See col. 1, lines 12-26 of Doushita et al.

Regarding claim 21, Doushita teaches that, after forming the photocatalyst film on the substrate, the substrate is dried and thereafter heat treated if necessary, to achieve densification, and improvement of the crystallinity of the titanium oxide. See col. 9, lines 52-58 of Doushita et al.

Although this reference teaches an overcoat layer comprising silicon oxide, aluminum oxide, titanium oxide, zirconium oxide, and cerium oxide (col. 10, lines 20-28), the reference does not teach or suggest the claimed atomic ratios as recited in claims 6-8.

However, Doushita et al. teach that the overcoat layer preferably contains 50% by weight or more of silicon oxide (col. 10, lines 27-28). From this teaching, it would have been obvious to the skilled artisan to determine optimal weight percents of silicon oxide, zirconium oxide, and aluminum oxide in the overcoat layer, and from these percentages, determine the atomic percentages of Al, Si, and Zr, and obtain atomic ratios of these components, comparable to those recited in claims 6-8.

### ***Response to Arguments***

In response to Applicants' argument that "the anticipation rejection based upon Ogino and the obviousness rejection based solely upon Doushita did not encompass claim 13", the Examiner respectfully submits that, in the previous Office

Action, claims 1-5, 9-11, 13-15, 20, 21, 25, and 26 were rejected by Doushita et al. in a 102(b) rejection (Item 5 in the previous Office Action).

In response to Applicants' arguments that the cited references of record do not teach or suggest the claimed underlayer, the Examiner respectfully submits that Applicants' claims merely define the underlayer as having a crystallographic structure, but not as a component. The claims exemplify the substrate, the photocatalytic antisoiling layer, the thin nonporous layer, etc., but not the "required underlayer".

Thus, the skilled artisan would be motivated to reasonably expect that any layer, such as the alkali-blocking film of Doushita et al, or the layers disclosed in Boire et al., to assist in the crystallization of the photocatalytic antisoiling layer. Moreover, both Doushita et al. and Boire et al. teach layers that either prevent lowering of crystallinity of the titanium oxide film (col. 4, lines 8-58 of Doushita et al.) or promote the crystalline growth of  $\text{TiO}_2$  in the anatase or rutile form (col. 5, lines 21-30 of Boire et al.); these teachings are considered to read upon the limitation "assisting in the crystallization...of the photocatalytic antisoiling layer".

In response to Applicants' arguments traversing the combined teachings of Ogino et al. and Boire et al., the Examiner respectfully submits that although these references may teach different techniques of *producing* titanium dioxide layers (e.g., sputtering vs. CVD), the references are relied upon based on their teachings regarding the *layers themselves*—not on how said layers are produced. Boire et al. is considered to cure the deficiencies of Ogino et al., as Boire et al. teach a structure

similar to that of Ogino et al., wherein one or a number of thin layers with an anti-static, thermal, or optical function or promoting the crystalline growth of  $\text{TiO}_2$  in the anatase or rutile form, may be provided.

For these reasons, Applicants' arguments are not persuasive.

### ***Allowable Subject Matter***

4. Claim 31 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

The cited references of record do not teach or suggest the employment of  $\text{BaTiO}_3$  or  $\text{SrTiO}_3$  as the underlayer.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA L. HAILEY whose telephone number is (571)272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin C. Mayes, can be reached on (571) 272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA L. HAILEY/  
Primary Examiner, Art Unit 1793  
July 2, 2010